

# Transformer Monitoring Solution

Elevate Transformer Performance with Advanced Monitoring Solutions

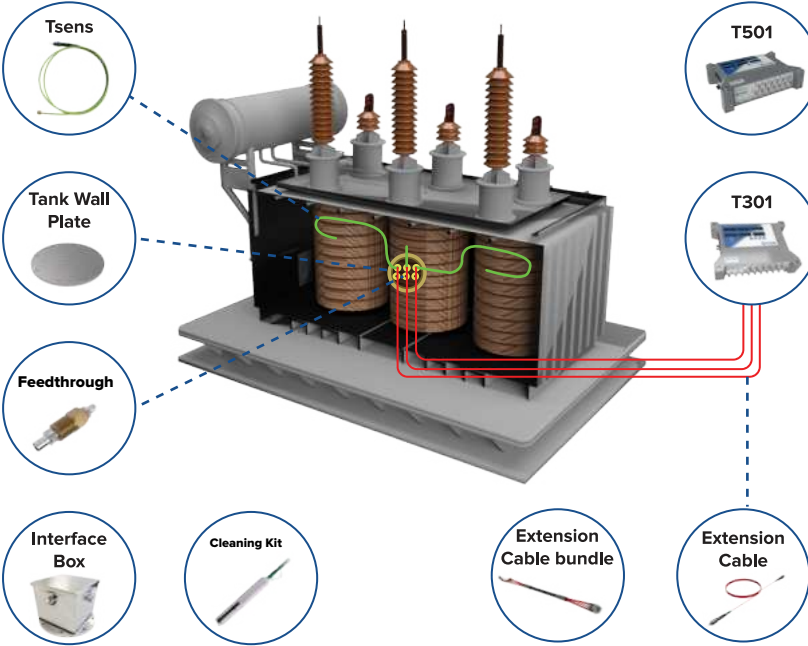
Power transformers are indispensable components in a wide array of industries, spanning from power generation to commercial applications. They operate tirelessly from the moment they are commissioned, gradually aging towards their end of life—a natural process that cannot be circumvented. Predicting the condition and estimating the remaining lifespan of a transformer is crucial for achieving uninterrupted operations. A transformer's longevity is primarily determined by its thermal constraints.



### RM's Hotspot Monitoring Solution

Rugged Monitoring's hotspot temperature monitoring replaces manual diagnostics with a fully-automated, high-resolution solution. By utilizing fiber optic monitoring systems with IoT Sensors, Edge Devices and Software sensing technology, our solutions offer direct measurement of internal hotspot temperatures at critical points within transformer windings.

With Rugged Monitoring's real-time monitoring system, businesses can now minimize risks and maximize uptime, aligning their proactive strategies with modern asset monitoring frameworks.

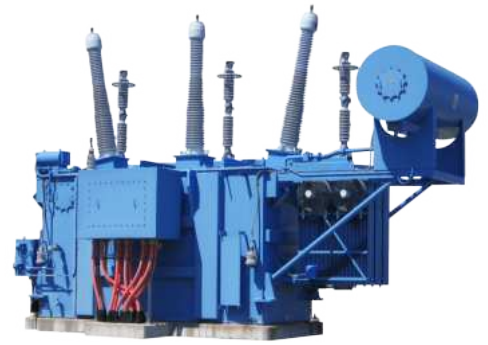


- Increase Accuracy of "Heat Run" Tests
- Detect Early Life Failures
- Transformer Dynamic Loading Response
- Transformer Performance Optimization
- Thermal Model Reflects Operating Conditions
- Enable Preventive Maintenance



## RM's Partial Discharge Solution

Partial discharge measurements on power and distribution transformers are proven tool to identify and locate insulation defects. The sensors installed on the transformer body, acquires High Frequency (HF) and Ultra High Frequency (UHF) PD signals and the PD monitoring system provides reliable diagnosis and recommendations.



### What can be tested:



Maintank



Winding Insulation



Bushings



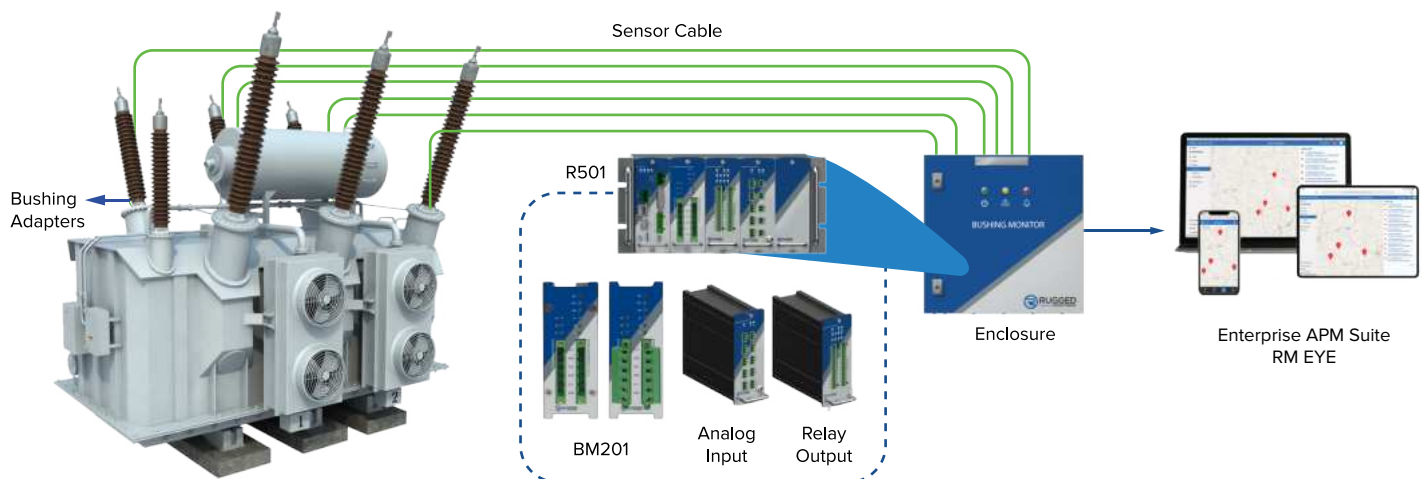
OLTC Insulation

## RM's Bushing Monitoring Solution

Rugged Monitoring presents an advanced bushing monitoring solution that gives predictive diagnostics to help users prevent malfunctions or breakdowns in wide range of power transformer bushing equipment. Our self-operating system and remote monitoring solutions present real-time diagnosis and allow utilities to work towards solving problems rather than finding them.

Routine maintenance, early replacement and traditional off-line testing have been used to address difficulties in bushing failures in the past. With the recent technology asset owners can detect failures and can directly reduce their maintenance downtime and costs.

## RM's Comprehensive Bushing Monitoring Solution



**Option 1: R501 Comprehensive Electrical Asset Monitoring System**

**Option 2: BM201 as a Standalone Bushing Monitoring Module**

We at Rugged Monitoring are motivated to provide innovative and exceptional quality products, our vision remains focused on meeting customer requirements while anticipating and exceeding the needs of a continuously changing dynamic market.

# RM's DGA Monitoring Solution

The evolution of transformer maintenance has witnessed a profound shift, transforming from a mere cost obligation to a pivotal strategic tool in the management of electrical transmission and distribution networks. In this dynamic landscape, the precise assessment of fault gases, moisture levels, and oil temperature within the transformer's insulating oil holds paramount significance. By meticulously monitoring the oil's condition, potential faults can be detected in their early stages, offering a preventive measure against unforeseen outages. This proactive approach not only ensures operational efficiency but also empowers decision-makers to optimize replacement intervals judiciously. Embracing DGA (Dissolved Gas Analysis) emerges as a pivotal advancement in this pursuit of efficient maintenance practices.

## R501 Rack Mount Comprehensive and Customizable Asset Monitoring Solution

R501, the customizable, rack mount, comprehensive electrical asset condition monitor is designed to monitor multiple electrical assets and its parameters enables a simple and user-friendly interface. R501 provides condition monitoring of electrical assets by focusing on preventing asset failures and reduce downtime. With our comprehensive monitoring solution, the health of assets can be determined, and maintenance activities can be scheduled. The R501, our versatile rack-mounted monitor, with its customizable features allow you to monitor multiple assets simultaneously, providing a user-friendly interface and an extensive range of parameters to track. The R501 focuses on preventing asset failures and minimizing downtime, empowering you to take proactive maintenance actions.



### Features of R501

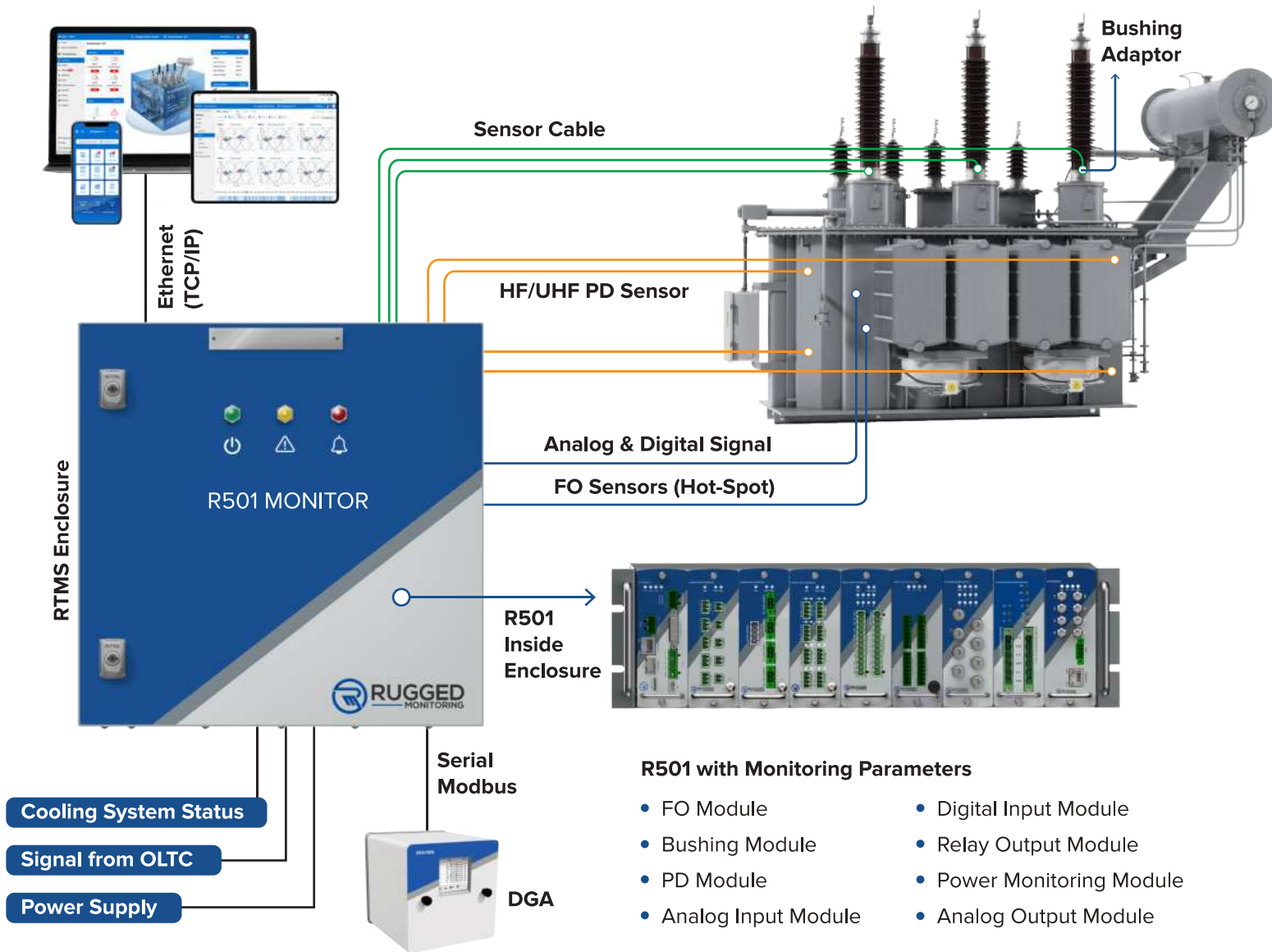
- Expandable with daisy chain & Field Upgradable to add different monitoring modules.
- Highly secure, web server-based visualization and configuration software
- Simple visualization & easy to configure.
- Equipped with most accurate & advance health assessment analytics.
- Range of communication options and protocol support; ethernet redundancy (PRP)

### Benefits of R501

- Improved asset reliability
- Accurate predictive analysis
- Access asset data from anywhere
- One monitoring solution for multiple assets
- Increased asset lifetime
- Highest return on investment
- Field upgradable with no device downtime



## System Architecture for Transformer



## RM EYE: Multi Site, Multi Asset Condition Monitoring Solutions

We at Rugged Monitoring have developed an AI based comprehensive electrical asset condition monitoring system “RM EYE” with multiple analytical capabilities in asset condition monitoring that stands way apart in technological advancement.

RM EYE is a versatile condition monitoring solution that can offer comprehensive analysis on various electrical assets spread across multiple industries. It considers every aspect in condition monitoring of different assets like transformer, cable, GIS, AIS, motor, generator, UPS, VFD, MV panel, battery, relays, etc and users to give the best recommendation for longer and better health of the assets.



## Features

- **Advanced asset health monitoring** with analysis and recommendations to increase asset effectiveness in addition to maximizing equipment uptime
- **Modern remote monitoring solutions** provide valuable insights to Multiple Assets at Multiple Sites from time to time
- **Establish a real time and consistent monitoring** by getting the right information into right hands
- **Simple and user-friendly interface** providing easy and fast access to all the features
- **Everything about the asset at one place**  
The raw data, analysis and recommendations
- **Advanced asset algorithms** for electrical assets to evaluate asset health
- **Advanced reporting technology with automated alerts**
- **An efficient, reliable partial discharge monitoring for all the assets**
- **A detailed comprehensive DGA analysis**
- **Built on well-established remote and cloud-based monitoring technology**
- **Quick configuration** so that you are not required to configure separately.
- **Protocols: IEC 61850, MODBUS, MQTT**
- **Robust integration with 3rd party systems and devices** with industry standard protocols
- **Bulk configuration imports for fast deployment**
- **Encompasses a secure access to data and configuration**
- **QR code scanner on mobile devices**
- **Accessible on web browser and mobile app**
- **Historical data storage and on demand access** via export feature
- **Extended multilingual support** to handle product inquires or troubleshoot problems proactively
- **Systematic fleet management analysis**
- **Offline test data integration and analysis**

## Benefits



### Company

- ✓ Single monitoring solutions for multiple assets
- ✓ Avoid unscheduled outages and increase asset utilization
- ✓ Extend asset life, with proper maintenance
- ✓ Reduce insurance premium with most advanced monitoring
- ✓ 24 x 7 remote monitoring, accessible from anywhere



### Manager

- ✓ Decision support system for short term and long term planning
- ✓ Company, region, substation analysis on your fingertips
- ✓ Effective management and tracking of monitoring KPIs
- ✓ Identify problem areas with interactive dashboards
- ✓ Advanced and automatic management/regulatory reports



### Asset Experts

- ✓ Deep analysis of diagnosed faults with advanced analytical tools
- ✓ Complete asset data at one location
- ✓ Customise and generate automatic reports for subscribed assets
- ✓ Ready access to historical data for root cause analysis



### Operators

- ✓ Quick identification of problematic assets in the network
- ✓ Get real time alarm/ alert notifications
- ✓ Realtime updates about the assets on mobile, desktop and emails
- ✓ Quick access to assets with QR code scan on handheld devices



# Why Customers Choose Us?

RM solution, the trusted monitoring solution for over 10000+ assets across 50+ countries. We are a leading High Value Electrical Asset Monitoring Company integrating fibre optic technology to the assets.



## Attention to Detail

It's our attention to the small stuff, scheduling of timelines and keen project management that makes us stand out from the rest.



## A plan for Success

Our Customers are well satisfied with the advisory services that we offer to help them with best in class technological performance and a long durable life.



## Experts only

We bring-in our diversified experienced team with over 100+ years of experience in Asset Monitoring



## Meeting Deadlines

Work with us, and you'll work with seasoned professionals – vigilant of deadlines, and committed to exceeding client expectations.



## Money Matters

We protect you against currency fluctuation with competitive and fair market prices



## Rugged Monitoring Services

Rugged Monitoring provides customization of sensors, monitors & software. In addition we offer on-site commissioning services, maintenance contracts and technical support to all customers worldwide.



## About Rugged Monitoring

Industry's leading team of asset condition monitoring experts with 100+ years of combined experience committed to delivering customizable solutions for challenging applications. We offer a range of reliable, high performance, customizable sensors and monitoring solutions that are immune to external influence.

# Certification



ISO 9001



ISO 14001



ISO 45001/  
OHSAS 18000



Lloyd's  
Register



ATEX  
Certification

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MONITORING  
MONITORING SIMPLIFIED